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Evans & Bottanley,
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ON THE GENERA *DIPLOCYSTIS* AND *BROOMEIA*.

By I. B. Pole Evans, M.A., D.Sc., F.L.S., and Averil M. Bottomley, B.A.

(With Plates XIX–XXIII.)

The genus *Diplocystis* was founded by Berkeley and Curtis in 1867 to describe a peculiar gasteromycetous fungus collected in the island of Cuba by Charles Wright.

Hitherto it has been regarded as monotypic and has only been recorded from Cuba, Bahamas, and the West Indies. The fungus is known as *Diplocystis Wrightii*, Berk. and Curt.

Some beautiful specimens of *Diplocystis* have recently been sent to us from Portuguese East Africa, and as it is the first recorded occurrence of this interesting genus from Africa, it is made the subject of the present note.

A single specimen was, in the first instance, forwarded for identification by Mr. T. R. Sim, of Pietermaritzburg, who had received it from the Rev. H. A. Junod, of Lourenço Marques. The latter gentleman very shortly afterwards forwarded further specimens to Pretoria, and stated that—"The natives call it 'Fole da mangapfi'—viz. the tobacco of the hawk—because, they say, it appears at the same time as the hawk, which is said to remain hidden during the winter to appear at the rainy season." Mr. Junod also remarked that "it is found generally in old fields and gardens not cultivated the preceding year."

Our examination of these specimens has revealed the fact that the African material is not identical with that from Cuba. We propose, therefore, to describe it as *D. Junodii*, nov. spec.

Diplocystis Junodii, Pole Evans and Bottomley, *nov. spec.*

Dense gregaria; massa fungina formae irregularis, 2–6 cm. lata × 2–7 cm. longa, usque 8–60 individua amplectens; exoperidio pateriformi, margine definito erecto et leniter incurvato; endoperidio subgloboso, sessili, scabro et subtiliter floccoso, griseo vel umbrino; peristomio conico, elevato-prominente, fimbriata brunneo, circulo pallescente cincto; capillitio laxo, pallide brunneo,

floccis flexuosis, simplicibus, 3·5–4·5 μ latis; sporis concoloribus, ellipsoideis, 6–8·5 μ × 3–4·5 μ levibus.

Hab.—Ad terram Lourenço Marques, Portuguese East Africa, legit H. A. Junod (Plates XIX and XX).

D. Junodii differs from *D. Wrightii*, as far as can be ascertained from the description of the latter, chiefly in the shape of the spores. In *D. Wrightii* the spores are described as globose, whereas in *D. Junodii* they are distinctly ellipsoid (Plate XXI, *b*). Lloyd (2), who records *D. Wrightii* from Bahamas and the West Indies, states that the endoperidium is "smooth"; Berkeley (1) describes it as "delicately filamentous." In our specimens it is slightly rough and floccose. Lloyd also states that the endoperidium "opens by small apertures at the top," and, in a footnote, adds: "It is not a definite, protruding mouth, as shown in figure in Engler and Prantl." Berkeley in defining the genus merely mentions "ore parvo ciliato," and in giving the specific characters, says, "opening somewhat after the fashion of *Geaster fimbriatus*." Our specimens from Portuguese East Africa exhibit a distinct fimbriated peristome (Plates XIX and XX).

The capillitium consists of fairly uniform, smooth, unbranched, wavy threads. Lloyd describes the capillitium in his specimens as made up of "various diameters from 3–30 mic., branched and interwoven. The thin shreds are almost hyaline, smooth, and not widely different from the hyaline capillitium of other gasteromycetes. The thick shreds are light yellow coloured, and, under a high power, marked with a dense reticulation."

Berkeley merely states, "Capillitium laxum." Both Berkeley and Lloyd describe the spores as globose, while the latter adds that they are "smooth or minutely punctate, many short-apiculate." The spores of *D. Junodii* are distinctly ellipsoid and smooth (Plate XXI, *b*).

The only other genus which in any way resembles *Diplocystis* is *Broomeia*, which was first described from South Africa in 1844 by Berkeley.

Three species have been described—viz.: *B. congregata*, Berk., and *B. ellipsospora*, V. Höhn, from South Africa; and *B. guadalupensis*, Lev., from Guadaloupe.

The correct identity of the latter species has been questioned by Lloyd, who points out that *D. Wrightii* has been found in Guadaloupe.

B. ellipsospora, V. Höhn, we have not seen, but from the description it might well have been placed in the genus *Diplocystis*, and may even be identical with our plant from Portuguese East Africa.

Both genera agree in that a number of individuals arise from a common stroma. In *Diplocystis* the stroma is rather thin and saucer-shaped (Plate XXI, *a*); in *Broomeia* it is usually thick and somewhat columnar (Plate XXI, *c*). In mature specimens of *D. Junodii* a part of the exoperidium remains as a definite coriaceous layer, the edge of the saucer enveloping each cluster of individuals; in *Broomeia* the experidium, when

ripe, flakes off and disappears entirely, leaving no rim to surround the individuals. In *D. Junodii* the saucer-shaped stroma is not smooth in the interior, but is thrown up into well-marked ridges, forming a separate compartment for each individual (Plate XX, Fig. 2).

In *B. congregata* this separation of the stroma into compartments is not so strongly marked and is often absent. *B. congregata* occurs frequently around Pretoria, and our examination of material at different stages of development has enabled us to confirm the accuracy of Murray's (3) description of the exoperidium of this fungus. The remains of the exoperidium on the specimens of *D. Junodii* which we have examined suggests that a similar common exoperidium covers all the individuals in this plant also. Lloyd, however, it should be noted, states that "*Diplocystis* has an individual exoperidium for each endoperidium." In conclusion, it should be mentioned that it is frequently stated that *B. congregata* grows on rotten wood. We have collected this fungus on a number of occasions in the neighbourhood of Pretoria, and have always found it growing on the ground in close proximity to the main stem of living trees of *Acacia Karroo*, Hayne (Plate XXII, Figs. 1 and 2), and have never yet found it associated with rotten wood. In several cases it has been noticed that trees thus associated with *Broomeia* were gumming freely from the main stem. An instance of this gumming is well shown on Plate XXII, Fig. 1, and at the base of the tree is an undeveloped plant of *B. congregata*. Fig. 2, Plate XXII, is a photograph of the same plant nine days later, after the exoperidium has begun to peel off.

The fructification on Plate XXIII, Fig. 1, is an exceptionally large specimen and measures 17 cm. × 15 cm. It contained just over 900 individuals and closely embraced the stem of an *Acacia* at the ground level. The exoperidium is still present on the edges of the left-hand portion. These fungi usually appear after rain in the months of December and January, and their presence can be detected at once before they are actually found by the peculiar powerful odour which they emit, somewhat resembling aniseed.

Bibliography.

(1) Berkeley, M. J.—"On a Collection of Fungi from Cuba," 'Journ. Linn. Soc.,' London, x, p. 344, 1869.

(2) Lloyd, C. G.—"Mycological Writings," vol. i, p. 141, 1903; and p. 193, 1904.

(3) Murray, G.—"On the Outer Peridium of *Broomeia*," 'Journ. Linn. Soc.,' London, xx, p. 311, 1883.

EXPLANATION OF PLATES XIX–XXIII.

PLATE XIX.

Specimens of *D. Junodii*, Pole Evans and Bottomley; natural size.

PLATE XX.

Specimens of *D. Junodii*, Pole Evans and Bottomley. The specimen in the lower right-hand corner shows the compartments into which the stroma is divided; all natural size.

PLATE XXI.

a. Diagram illustrating structure of stroma of *Diplocystis*. *b*. Spores of *D. Junodii*, Pole Evans and Bottomley; greatly enlarged. *c*. Diagram illustrating structure of stroma of *Broomeia*. *d*. Spores of *B. congregata*, Berk.; greatly enlarged. *e*. Photograph of a section through *B. congregata*, Berk., showing the individual "puff-balls" embedded in the thick, white, columnar stroma.

PLATE XXII.

Fig. 1. *B. congregata*, Berk., at the base of *A. Karroo*, Hayne, showing the white exoperidium. Fig. 2. The same plant photographed nine days later, after the exoperidium has disappeared. Both greatly reduced.

PLATE XXIII.

Fig. 1. A large specimen of *B. congregata*, Berk., removed from the base of an *A. Karoo* tree. The gap in the upper portion is where the fungus wrapped almost round the stem of the tree. The specimen contained over 900 "puff-balls." Much reduced. Fig. 2. A specimen of *B. congregata*, Berk., photographed from above, and showing the exoperidium before it has begun to peel off. Natural size.

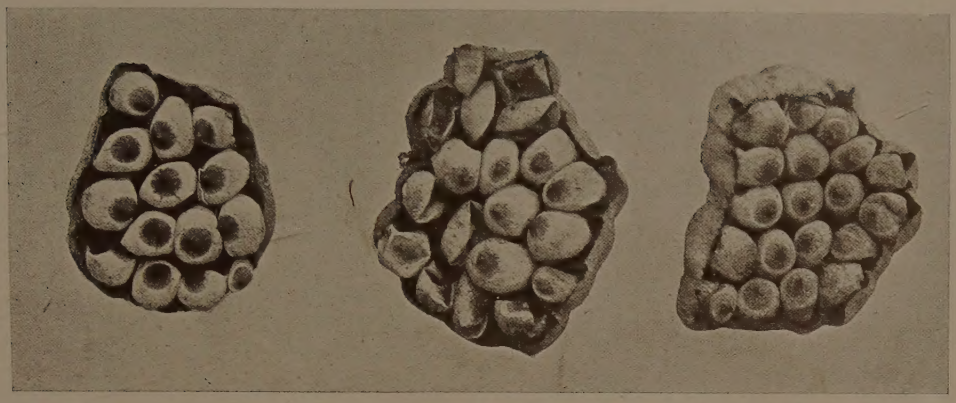

Fig. 1.

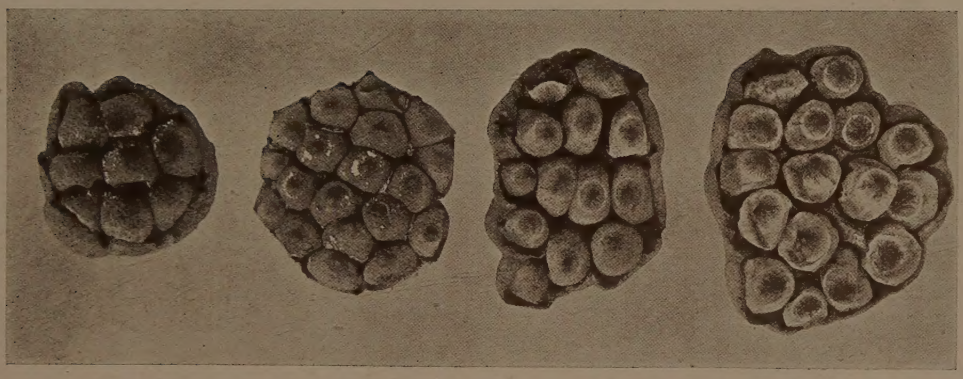

Fig. 2.

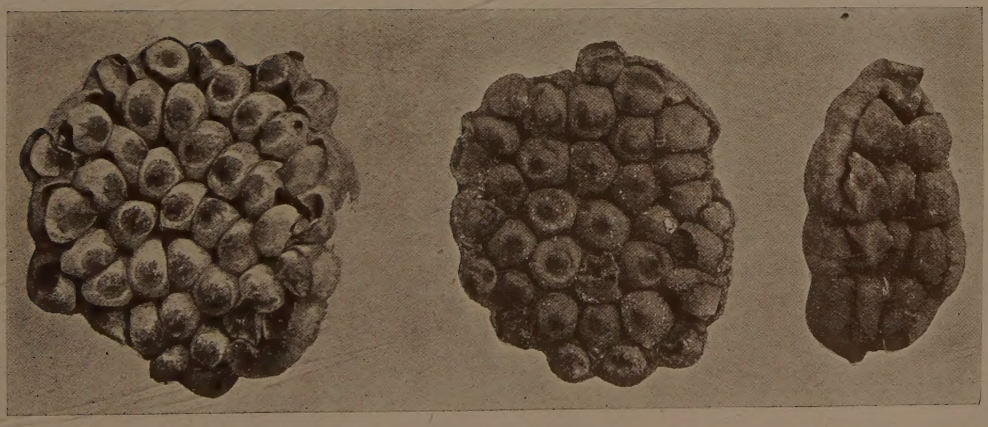

Fig. 3.

Diplocystis Junodii, n. sp. Pole Evans and Bottomley.

Phot. I. B. Pole Evans. *Adlard & Son & West Newman, Ltd.*

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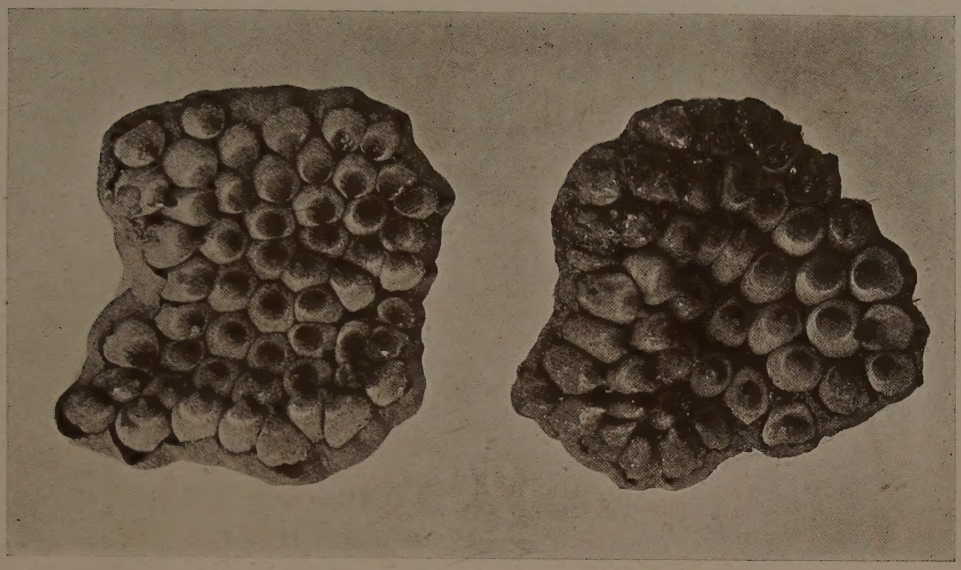

FIG. 1.

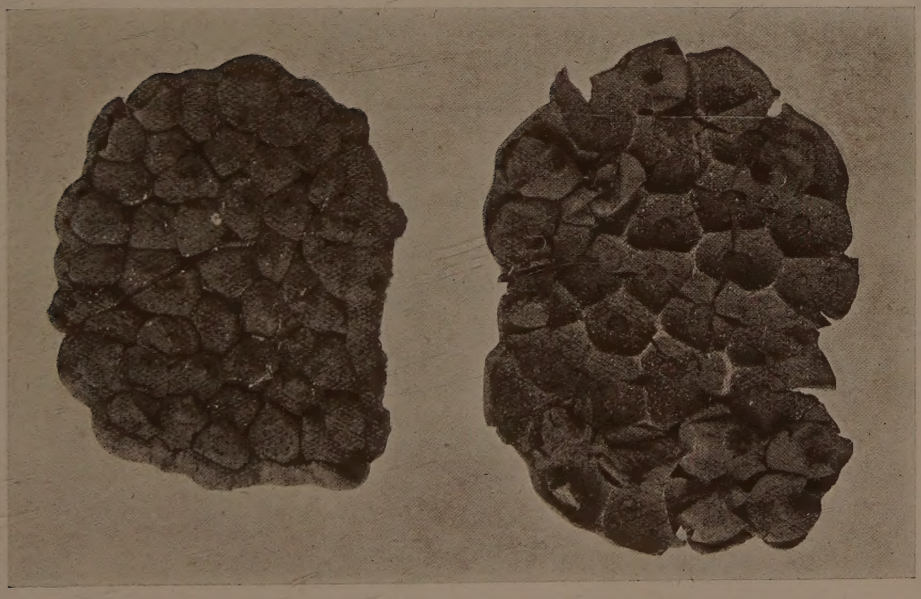

FIG. 2.

Diplocystis Junodii, n. sp.

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Fig. 1.—**A**. Section through *Diplocystis Junodii*, n. sp. (diagrammatic). **B**. Spores.

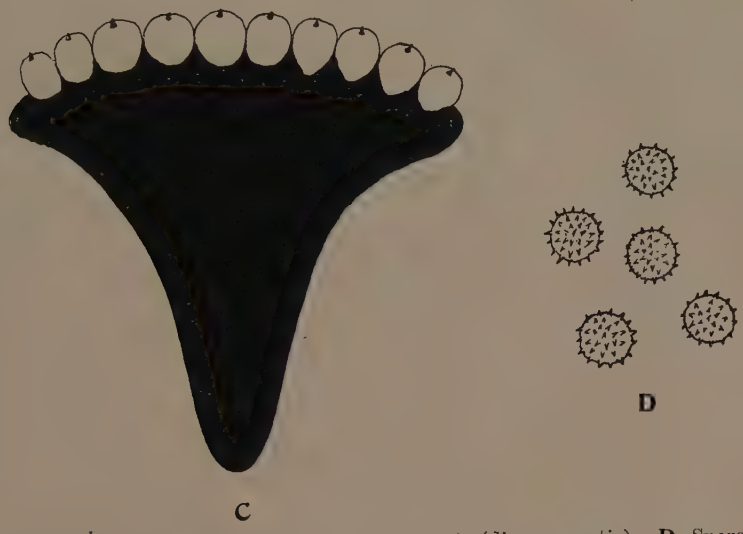

Fig. 2.—**C**. Section through *Broomeia congregata* (diagrammatic). **D**. Spores.

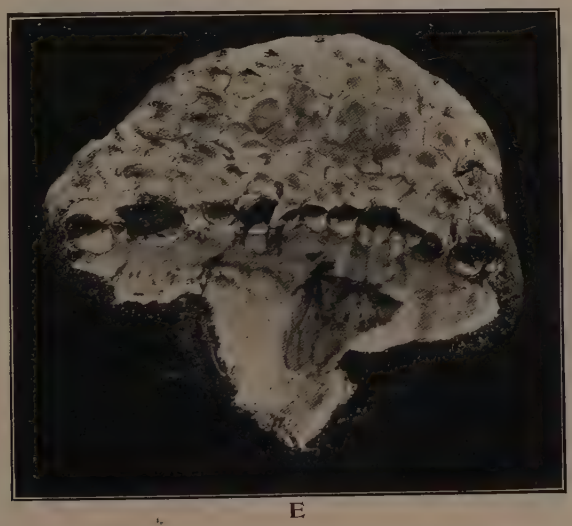

Fig. 3.—**E**. Section through *Broomeia congregata* (phot.).

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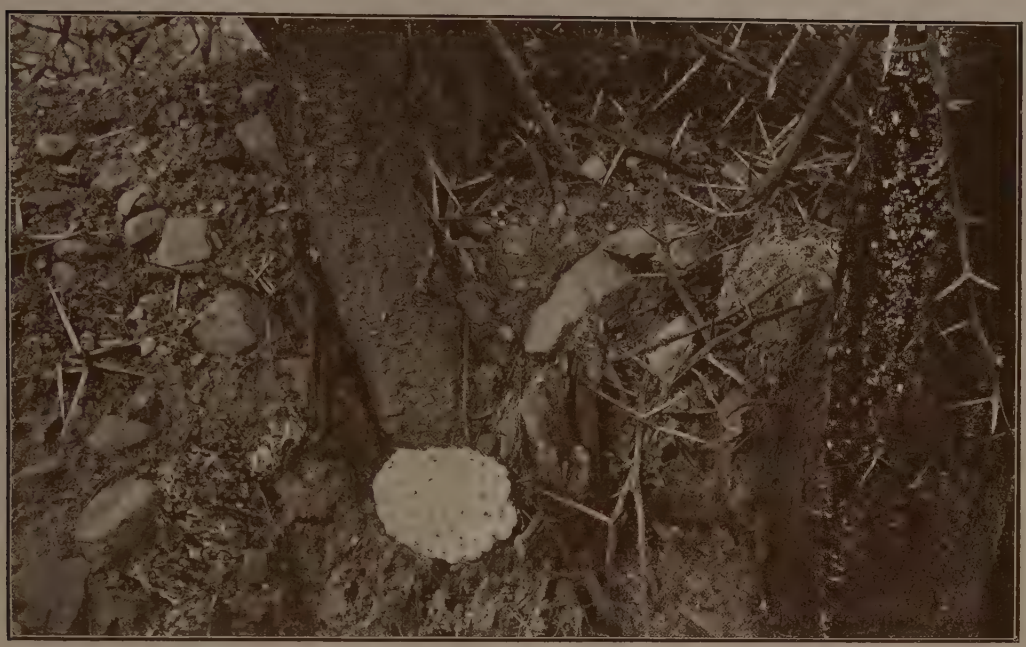

Fig. 1.—*Broomeia congregata* at base of *Acacia Karroo*—young stage.

Fig. 2.—Same—nine days later. (This plant contained sixty individuals.)

Phot. I. B. Pole Evans. *Adlard & Son & West Newman, Ltd.*

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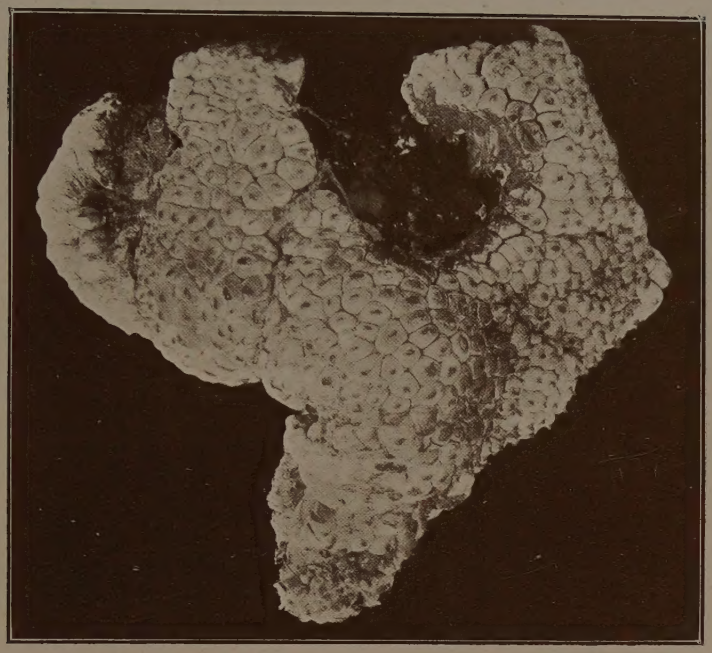

Fig. 1.

Fig. 2.

Broomeia congregata.

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